

EPA Region 1 RAC 2 Contract No. EP-S1-06-03

January 31, 2013
Nobis Project No. 80021

Via Electronic Submittal

U.S. Environmental Protection Agency, Region 1
Attention: Mr. James DiLorenzo, Task Order Project Officer
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3919

Subject: Review of Preliminary OU1 Remedial Investigation Report Remaining Issues –
January 2013
Olin Chemical Superfund Site, Wilmington, Massachusetts
Remedial Investigation/Feasibility Study Oversight
Task Order No. 0021-RS-BD-01CH

Dear Mr. DiLorenzo:

Enclosed is the Review of Preliminary OU1 Remedial Investigation Report Remaining Issues –
January 2013 for the above referenced Task Order.

Should you have any questions or comments, please contact me at (978) 703-6013, or
hford@nobiseng.com.

Sincerely,

NOBIS ENGINEERING, INC.



Heather M. Ford
Associate / Senior Project Manager

Enclosure

c: File 80021/MA

**REVIEW OF
PRELIMINARY OU1 REMEDIAL INVESTIGATION REPORT
REMAINING ISSUES – JANUARY 2013
OLIN CHEMICAL SUPERFUND SITE
WILMINGTON, MASSACHUSETTS**

A review was conducted of Olin's January 2013 replies to comments on the August 2009 RI Work Plan, as well as Olin's November 16, 2012 submittal of the "Chemicals of Potential Concern Selection Exercise" and the November 16, 2012 Work Plan Addendum. Most of the issues have been resolved through the back and forth of comments, responses, and meeting discussions. A few issues remain unresolved or need resolution of details. These issues are discussed below:

Comments

1. EPA would like to see OU1 and OU2 combined.
2. CAP data – Olin presented a summary of the data for the containment area soils in their 2012 Work Plan Addendum (Appendix B). During the Work Plan Addendum review, it was observed that the current summary data Olin has provided for use in future risk assessments appears less contaminated than the rest of the Site (when summary cap data is compared to the data summarized in the preliminary draft OU1 RI Tables 4.1-1 and 4.1-2). Historically, the cap area was used to consolidate excavated materials from contaminated areas of the Site, buried drum and debris areas etc.; therefore, the dataset in the Work Plan Addendum seems inconsistent with past history. It is EPA's understanding that Olin presented only data for which they had coordinates and excluded anything excavated from somewhere else and disposed of in the cap area. Thus, all the highly contaminated materials, which were deposited in the containment area from elsewhere on the Site, are not in the data set, and the data looks "pretty clean." Data that represents what is under the cap now is needed to describe contamination and evaluate potential risks. EPA does not object to use of data without coordinates from stockpiles before materials were disposed of in the capped area. Please provide data that reflects the history. Although the precise location or depth of samples will not be known, assume it is in the 1-10 ft range and average it all into the exposure point concentrations.

- An example of a dataset for cap soils that is not included on the summary table, is data mentioned in the FRI report. In the FRI report, the C-RAM Status Report No. 1 (GEI, 2000c) refers to 3 soil stockpiles for on-site re-use: SP7A and SP13A from near the Buried Debris Area (combined 250 cy) and SP17A from the Delta (50 cy). Analytical results for composite samples of each pile (SVOCs including bis(2-ethylhexyl)phthalate at 671 mg/kg, VOCs including total TMPs at 9.7, and chromium at 330 mg/kg) were presented in Appendix K of that report. VOC analysis was performed on a grab sample from each pile. Samples were collected on September 22, October 9, and October 27, 2000 for stockpiles SP7A, SP13A, and SP17A respectively. Based on this report, all of the material from those 3 stockpiles was re-used/placed within the containment area/cap. However, these samples are not included in the recent Work Plan Addendum summary of the data for the containment area soils.
 - Olin should provide an explanation for all former reports/datasets that detail soils placed in the containment/cap area and include that data on the summary table.
 - Data representative of current conditions under the cap (0-10 ft) must be used to evaluate hypothetical future exposures and determine conditions under the temporary cap in support of permanent remedial action. If it is not available, further sampling under the cap will be required to support EPA final Site cleanup decisions.
3. Specialty compounds – Preliminary agreement has been reached to exclude specialty compounds in the TAL for any additional OU1 soil samples; however, formal approval awaits formal submission of support for the decision to exclude specialty compound sampling from further analysis of OU1 soils. The tables shown at the October 11, 2012 meeting (EPA, MassDEP, and Olin) demonstrated the absence of specialty compounds in OU1 soils at concentrations of concern for direct contact exposures to soil. Some of these tables were provided in an email transmission to Mr. Marc Bouvier of Nobis on November 6, 2012, but tables alone are insufficient to support a decision. These tables do not demonstrate that specialty compounds in soils are present at concentrations protective of potential to leach to groundwater. In addition to the tables shown at the October 11, 2012 meeting, please provide figures, particularly for hydrazine,

formaldehyde, and diphenylamine, to demonstrate sampling locations cover the locations most likely to be impacted by these contaminants. Since a representative dataset for soils beneath the cap has not been presented, conclusions regarding specialty compounds presence or absence beneath the cap cannot be reached at this time. Reducing the TAL list, should apply to soils at OU1, exclusive of soils under the cap, and does not apply to sediment, surface water, and groundwater.

4. Industrial RSLs and Residential RSLs – EPA concurs with the use of industrial RSLs for soils for evaluating soils at this industrial Site, for delineation of Nature and Extent in soils, and for purposes of meeting data quality objectives for soils. Despite the industrial nature of the Site, EPA policy is to select COPCs for the HHRA using residential RSLs. Olin has argued that this is too conservative. Olin provided a requested comparison of impacts to COPC selection of residential vs. industrial screening levels (November 16, 2012 submittal of the “Chemicals of Potential Concern Selection Exercise”). Comments on this material are provided below:

- The materials provide convincing evidence that use of industrial RSLs for soil COPC selection at this Site will not result in omission of significant risk. However, the exercise should be updated once the December sampling results are in and include all soil data including representative data for soils under the cap.
- Please clarify what data are used for the evaluation.
- Trivalent chromium screening levels were used to evaluate total chromium concentrations in the absence of hexavalent chromium data. In the absence of chromium speciation data, this is not sufficiently conservative. The new hexavalent chromium data collected during the December 2012 sampling efforts should clarify whether the total chromium data is reflective of hexavalent or trivalent forms and allow for a better determination of which screening levels are appropriate.
- EPA continues to request that comparison to industrial RSLs will be provided on the point-by-point data tables of the RI (for example on Table E-2-2 from the preliminary draft OU1 RI).

5. Leaching – Olin’s evaluation of leaching has demonstrated that no leaching from soil is currently occurring. However, EPA requests that Olin present soil data summary tables with comparison to SSLs in the RI, as a first step in identifying the potential for leaching and leading into the evaluation they did. The leaching evaluation and relationships between soil and groundwater will be discussed in the CSM/ F&T section of the OU1 RI. Note since the demonstration did not deal with under the cap soil, leaching may be occurring there. Deep soils are sitting below the water table; these soils and the interaction between them and the groundwater surrounding them will be addressed as an OU3 issue.
6. CSM – The Olin replies are sometimes contradictory. The CSM must cover everything known to date about interrelationships between media, including, but not limited to, the following:
- Olin agreed to include discussions of NDMA from the FRI, but EPA also asked those discussions be updated with new information collected since the FRI.
 - Olin stated DAPL would not be addressed in the OU1 report.
 - Olin also stated draft RI would discuss interaction of groundwater and OU1 surface water and sediment, including association between DAPL and the groundwater at the property.
 - Olin agreed to expand the CSM by including more information on operational history, past disposal practices, and removal/remedial actions.
 - Olin agreed to provide specific references to past documents; EPA continues to request brief summaries of basic facts of past activities in the RI.
 - The CSM should include discussion of broad classes of contaminants, specific Site-related contaminants (NDMA, TMPs, BEHP, chromium, ammonia), chemicals of known historical use at the Site, and contaminants most likely to drive risk (HH or Eco) from OU1 soil, sediment, or surface water exposure or migration from those media to other media or off-site.

- Olin agreed to add discussion of Central Pond and the stormwater detention pond.
- The CSM will include the leaching evaluation.
- Olin agreed to add discussion of TMPs, ammonia, arsenic, copper, cobalt, and manganese in context of groundwater/surface water interaction.
- Calcium Sulfate Landfill (CSL) –
 - Although the CSL has been capped and closed under Massachusetts DEP regulations, the OU1 RI must determine if the CSL represents a significant source area.
 - EPA has requested discussion of groundwater results at locations adjacent to and down-gradient of the CSL and the possibility of the CSL acting as a source. Olin continues to be unresponsive to this request, stating that this is an OU3 issue. It is clear to all stakeholders that groundwater is an OU3 issue; however, if there is the potential for contamination to be leaching to groundwater, this source area is an OU1 Issue. Please provide the requested material, data, and evaluation.
 - Please reference the Existing Geomega Technical Series Report related to discrimination of water quality related to the Woburn Landfill in the RI and update the discussion with current data.
- Olin agreed to add discussion of amine compounds from Plant B effluent. EPA notes that the NDMA surface water ecological screening levels used by Olin in their ecological risk assessment (preliminary Draft RI Chapter 7.0) are not widely accepted. Olin provided two NDMA freshwater benchmarks for comparison, a screening benchmark of 0.117 mg/L, and an effects benchmark of 35mg/L. The screening value is referenced as coming from EPA Region III screening benchmarks and is referenced in the EPA Region III benchmark document as coming from Oregon DEQ as a Level II Screening benchmark. The effects benchmark is an

estimated value developed using the ECOSAR structural activity relationship program, which estimates LC50 values based on biologically active functional groups. Olin's approach seems reasonable given the limited aquatic toxicity data available for NDMA, but the values should be confirmed independently. Please note the limited toxicity data on which these are based in the discussion.

7. Attachment A – Detection Limits. A review was conducted of the RTC Attachment A regarding sample quantitation limits (SQLs) versus method detection limits (MDLs) and comparison of the non-detect data to industrial regional screening levels (RSLs). EPA has been concerned that detection limits have not been low enough to rule out the presence of contaminants at levels of concern in some samples reported as non-detects. This concern is primarily focused on high reporting limits (SQLs) for PAHs, which appear to be due to the need for sample dilution in the laboratory because of high bis-2-ethylhexylphthalate (BEHP) concentrations.

- According to the last paragraph on page 108 of the RTCs, Olin states that, “If the result in the field sample is greater than the action level, the validated result is reported as a detection (with a “J” qualifier)...” This is incorrect. The result is reported without qualification.
- Olin has provided a comparison that demonstrates that the great majority of data meets the industrial RSLs, particularly if the comparison is made to the MDLs. However, it is the SQLs that are the U values that will be entered into the ProUCL calculations and shown on figures and many of these are above the industrial RSLs. MDLs are available for roughly 60% of the surface samples and only 25% of 1-10 ft samples, and apparently none at all for some analyte classes. EPA is concerned that more of the data do not have available MDLs for inclusion in this comparison and with the assumption that MDLs for the older data are the same as the available MDLs. Given that the data without MDLs are from some time ago, EPA acknowledges that it is difficult to go back and retrieve the MDL data. It is reasonable to assume that the MDLs are likely 2-10 times lower than the SQLs. EPA concludes that a comparison of SQLs from data with MDLs and SQLs from data without MDLs may aid in providing assurance that MDLs (actual or assumed) for the majority of data are adequate to assure the absence of contaminants in soil at these

locations above levels of concern. The laboratory typically reports to the SQL when not detecting a result to the MDL; however, it is an option in most LIMS to allow reporting to the MDL (i.e., MDL U), when not detecting a result at the MDL. Going forward if Olin switches to a reporting scenario where the laboratory reports down to the MDL (i.e., reports NDs at the MDL), the ProUCL will be using the MDL results for calculations.

- In the case of PAHs, if SIM analysis is done, this should focus testing on these compounds, eliminating the interferences of BEHP in future analyses. This would require additional sampling for PAHs via SIM analysis in a few samples where detection limits for PAHs have been elevated due to BEHP interference. However, a figure showing the data that will be used in the risk assessments after removal of the “unusable” PAH data should show/not show that there is adequate spatial coverage of usable data and avert (or confirm) the need for more sampling.
- Olin has provided figures of benzo(a)pyrene data with SQLs or MDLs exceeding the industrial RSL and the ratio of the SQL or MDL to the RSL. Of the 600+ samples summarized in Tables 1A and 2A, only a few show up on the figures. The figures only show data collected from 2009 and on. The figures in the preliminary draft OU1 RI (see Figure 4.1-14 for example) showed many more samples with U values exceeding the industrial RSL. It appears these samples are older data. Please present figures with all data that will be used in the risk assessments with SQLs or MDLs exceeding the industrial RSL.
- EPA has NOT agreed that no more PAH data is needed in the soil along the South Ditch. Such an agreement is dependent on demonstration that the remaining data after exclusion of unusable data is adequate to determine presence or absence of PAHs and/or statistical demonstration that exclusion of the data does not impact exposure point concentrations (Attachment B).
- All figures in the RI that present non-detects should differentiate between those SQLs above or below industrial RSLs using differing symbols or colors.

8. Attachment B – “Unusable” data. Review of the RTC Attachment B regarding use of data with elevated reporting limits, which Olin deemed unusable data for risk assessment because the reporting limits were more than ten times the industrial RSLs. EPA has been concerned that removal of the data from the risk assessment may leave a PAH data gap and that the high detection limits do not provide assurance that PAHs are not present at concentrations of potential levels of concern. This concern is primarily focused on high reporting limits (SQLs) for PAHs, which appear to be due to the need for sample dilution in the laboratory because of high bis-2-ethylhexylphthalate (BEHP) concentrations. EPA requested that Olin provide a comparison of exposure point concentrations (EPCs) with and without the data with elevated reporting limits as a sensitivity analysis of the impact of excluding or including the data in question. Olin has provided a comparison of EPCs developed using ProUCL software without the data with elevated reporting limits vs. EPCs developed using ProUCL software with the data with elevated reporting limits, but with the reporting limits for these samples set to 0.0 mg/kg. Results indicated that the EPCs were generally lower, but not substantially different. Adding many samples with a zero concentration would generally be expected to reduce the EPCs; however, as Olin notes, the UCL statistic sometimes changes with the increased number of samples and may result in slightly elevated EPCs.

- The analysis does not provide an adequate sensitivity analysis for determining the impact of excluding the data. A better sensitivity analysis would include EPCs calculated by ProUCL with and without the data in question using $\frac{1}{2}$ the U values and using regression of order statistical procedures for substitution of non-detects.
- As described above, a figure showing the data that will be used in the risk assessments that remains after removal of the high SQLs “unusable” data will show/not show that there is adequate spatial coverage of usable data and (no) need to spend efforts on these statistical arguments.

9. Attachment C – Background soil samples. Review of RTC Attachment C presents the plots of the various candidate background sample data from the southern portion of the Site. As discussed in the fall meetings, these plots support keeping the 6 samples identified as potential in wetland areas as well as the 3 samples from drier areas for use as background soils. EPA asked Olin to revisit the two samples eliminated earlier by

adding these to the plots and considering the validity of adding them back into the background dataset.

- As Olin indicated in their RTCs (comment 14, page 16), SS-440 looks different enough to continue to exclude it from background. EPA agrees.
- It appears that Olin has concluded that SS-442 is similar enough to keep. EPA disagrees. SS-442 has the highest concentrations of several PAHs and metals, as well as ammonia, even including SS-440.
- Please continue to exclude both SS-440 and SS-442 from background soils.

10. Use of Older Sediment Data – As has been discussed in previous communications, it is noted that HHRA COPC selection data summary tables in the preliminary draft RI present fewer samples than summarized in Nature & Extent tables, but more sediment samples than the few sampled in 2010 and 2011. For South Ditch, the table includes samples from 2005, 2007, 2009, and 2010 including samples that will now be shifted to OU2. Even including all these, there are very few samples for many analytes. For the on-property West Ditch, the table includes samples from 2000 and one sample 2003, no “recent” samples.

It is EPA’s opinion that a formal correlation study of paired samples cannot be conducted because of the limited sample size and lack of pairing; however, a comparison of the old and new sediment data sets is still possible. The original question is, “Are older sediment data similar enough to newer data to be useful in the RI and risk assessments?” That is, a comparison of two data sets to see if their populations are significantly different is needed. This is best done with two data sets of roughly similar size and data distribution and representing similar locations. EPA would like to see recent RI data (2009-2012) compared to data before 2009 and after excavation events, (this “older” data should only include samples Olin plans to use in the risk assessments). This can be accomplished as follows:

- Figures should be prepared showing sample locations for the two datasets, similar to what was presented by Olin, but not pre- and post-2002.

- Box plots for several contaminants of interest presenting graphic depictions of the data distribution in each data set (box plots should show the “new” and “older” data sets, for each contaminant of interest side-by-side). These will help in determining data distributions and provide a quick visual of similarity of data sets (Note: ProUCL software should be used to confirm distributions.)
- If data are normally distributed, use the t-test to compare data sets.
- If data are not normally distributed, use the Mann-Whitney test to compare data sets.

11. Although surface water and sediment background data cannot be collected onsite for OU1, concern still exists regarding the adequacy of the existing surface water and sediment background dataset and how it will be used when making comparisons to areas like South Ditch.

12. 2012 Work Plan Addendum – Several additional samples were recommended in the EPA’s conditional approval of the November 16, 2012 Work Plan Addendum. A follow-up conference call was held on December 13, 2012 to resolve those remaining conditions. A final Work Plan Addendum should be provided presenting how each of the conditions was addressed and any changes to the November Work Plan Addendum.

13. Vapor Intrusion – EPA has suggested soil gas samples to evaluate vapor intrusion. Olin has dismissed consideration of vapor intrusion potential at the trailer on-site. EPA vapor intrusion guidance (*EPA Engineering Forum Mitigation Guidance, October 2008 - Sections 2.3.2 and 4.4.2.3 (reference to Mobile Home foundation type)*) establishes that trailers with skirts do have vapor intrusion potential and must be considered as a potential exposure point. Soil gas sampling both in the vicinity of the trailer and at locations of potential future building construction may be needed for the OU3 vapor intrusion evaluation.

14. Other –

- a. A list of illegible boring logs was included in the comments with a request these specific logs be typed, Olin has agreed to review them and type those that are illegible. EPA expects each of the ones requested will be typed.
- b. Please present visual observations from borings on a table, including field parameters. EPA appreciates that Olin has agreed to provide PID readings in tables; however, EPA is concerned that these readings are not recorded in the boring logs.
- c. Evidence of trespassing – EPA is convinced the hunter's perch was located on the Olin property within the portion of the property with the conservation restriction. Past instances of graffiti on buildings provides further evidence of trespassing. Do not dismiss this exposure pathway.
- d. Missing items in RTCs – electronic submittal of historical data in comment #50, “attached” tables in comment #54. Nothing was attached.
- e. Human health exposures – EPA is expecting industrial exposure in “wetlands” and evaluation/risk assessment of soils under cap.
- f. EPA has requested further sampling in deep soils for N-nitrosodiphenylamine at Lake Poly 1-02 and BH12. Olin's response stated that detections above the industrial RSL of N-nitrosodiphenylamine at Lake Poly 1- 02 and BH12 are bounded by other samples as shown in Figure 4.1-21. This figure demonstrates bounding in a horizontal plane, but does not provide evidence of bounding vertically. Please sample soil beneath the cited samples, provide evidence of vertical bounding, or provide evidence that deep soils at these locations would be below the water table.
- g. Sediment sampling for hexavalent chromium in East Ditch – not included in December sampling - postponed to OU2.
- h. Sediment samples from 2008 – Pending decisions on use of “older” sediment data for risk assessment, EPA will accept sediment samples from 0-0.5 ft as usable in

ERA with some flexibility. Samples with top depth of 0.3 ft do not necessarily have to be excluded, dependent on bottom depth.

- i. Expanded nitrosamines - Groundwater (GW-10S and GW-10D) has been tested for expanded nitrosamine. EPA has the results and is reviewing them. Further discussion will occur under OU3.
- j. Olin has agreed that interpretations of bedrock surface elevations will not utilize data collected during direct push activities without corroborating mechanically collected data (augers, drive and wash, sonic, etc.).